

JULY 1976

No. 7



FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



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NATIONAL MARINE FISHERIES SERVICE

SOUTHWEST FISHERIES CENTER
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LA JOLLA, CALIFORNIA 92037

FISHING INFORMATION

JULY 1976 , No. 7



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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

In this July 1976 issue we are initiating a system whereby computer-drawn plots of XBT sections produced at NMFS Pacific Environmental Group, Monterey, are reproduced directly for publication (see Figures 10 and 12). In accord with the policy of changing to metric units, the distance scale along the sections is in kilometers. For an interim period, when there are computer plot failures, the section will be drafted as in the past (Figure 11). We ask that you bear with minor inconsistencies between formats for the computer-drawn and hand-drafted figures.

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department.

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
 J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, 10, 11, 12 and
 15 day Supplement)

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Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Californian*, *Hawaiian Enterprise*, and *Hawaiian Queen* of the Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Center. The project is partially supported by the National Science Foundation and the Office of Naval Research.

Sea Surface Temperature and Environmental Conditions

N. CLARK AND F. MILLER

Eastern North Pacific

Seasonal warming continued to cause sea surface temperatures to increase over the entire eastern North Pacific during July 1976. The area of greatest warming was centered near 35°N and 170°W where temperatures increased by 5 to 8°F (2.8 to 4.4°C) between June and July.

The relatively large area of 1 to 3°F (0.6 to 1.7°C) above-normal temperatures between 30°N and 45°N and 140°W and 170°W that appeared during June disappeared during July, and the sea surface temperature anomaly pattern in this region is now similar to those of the previous spring and winter months of 1976. This reversal indicates that the above-normal temperatures were confined to a shallow-surface layer and that the excess heat was removed through increased evaporative and conductive cooling at the air-sea interface and vertical mixing due to above-normal winds over the area.

Surface temperatures south of the Aleutian Islands continued to rise at above-normal rates, and the July anomaly pattern shows 1 to 2°F (0.6 to 1.1°C) above-normal values in this region.

Below-normal temperatures offshore Washington, Oregon and northern California increased to 1 to 3°F (0.6 to 1.1°C) above-normal values due to decreased northerly winds and, less intense upwelling. However, below-normal temperature conditions persisted off central California.

Sea level pressures were up to 7 millibars below normal over most of the eastern North Pacific during July, resulting in a weakened high pressure cell that was centered near 35°N and 160°W. Strong north-south pressure gradients between 35°N and 45°N caused above-normal westerly winds, which in turn, resulted in above-normal evaporative and conductive cooling in this region. Slightly above-normal pressures along the coast and an intense thermal low over the Pacific Southwest caused strong northwesterly winds off California and Baja California which maintained strong upwelling in these areas. Coastal upwelling decreased off Oregon and northern California due to weaker north-to-northwesterly winds.

Western North Pacific

The greatest change in the sea surface temperature anomaly pattern during July 1976 occurred between 30°N and 40°N and 160°E and 180° where contrasting 1 to 4°F (0.6 to 2.2°C) positive and negative temperature anomalies formed next to each other and caused strong horizontal sea surface temperature gradients.

Temperatures dropped to 2 to 4°F (1.1 to 2.2°C) below-normal values over a large area of the western North Pacific between 20°N and 35°N and 125°E and 160°E.

An area of 1 to 2°F (0.6 to 1.1°C) above-normal temperatures formed east of Honshu, while the area of 1 to 2°F (0.6 to 1.1°C) below-normal temperatures east of Hokkaido spread northeastward during the month.

Eastern Tropical Pacific

From June through July of each year, sea surface temperatures (SST) normally decrease 2 to 3°F (1.1 to 1.7°C) in the Peru Current north of 20°S and along the equator from 115°W to the coast of Ecuador. Elsewhere in the southern hemisphere SST's normally cool less than 2°F (1.1°C). In the northern hemisphere seasonal warming takes place in most areas with a maximum increase of 2°F (1.1°C) in July along the southwest coast of Baja, California from 20°N to 25°N. Between 90°W and 110°W and south of 15°N some cooling normally occurs where southerly winds associated with tropical storms intensify the mixing in the upper layers of the ocean.

The expansive warming which began in June 1976 and continued through July in the equatorial region and along the coast of South America stands in great contrast to the description of changes which normally can be expected. In the southern hemisphere the seasonal cooling in the Peru Current and along the equator failed to appear for the second successive month. The SST pattern (Figure 8) and the SST anomalies (Figure 9) resembled those of July 1975 and to a lesser degree those of 1972. Both of these years were classified as El Niño years where extensive mid-winter warming took place in the eastern tropical Pacific in the southern hemisphere and again in mid-summer (December-January). The SST's in the Peru current and along the equator to 160°W increased since June 1976. Thus, the areas of positive SST anomalies greater than 2°F (1.1°C) also increased. Below-normal surface pressures and surface winds south of the equator to 20°S between 110°W and the coast of South America were associated with an unusually weak subtropical high pressure center off South America. Low pressure centers and weather fronts frequently passed eastward through the area (centered near 30°S, 90°W) which is usually occupied by high pressure. This resulted in periodic weakening of the southeast trade winds over the entire area south of the equator which shows positive SST anomalies in Figure 9.

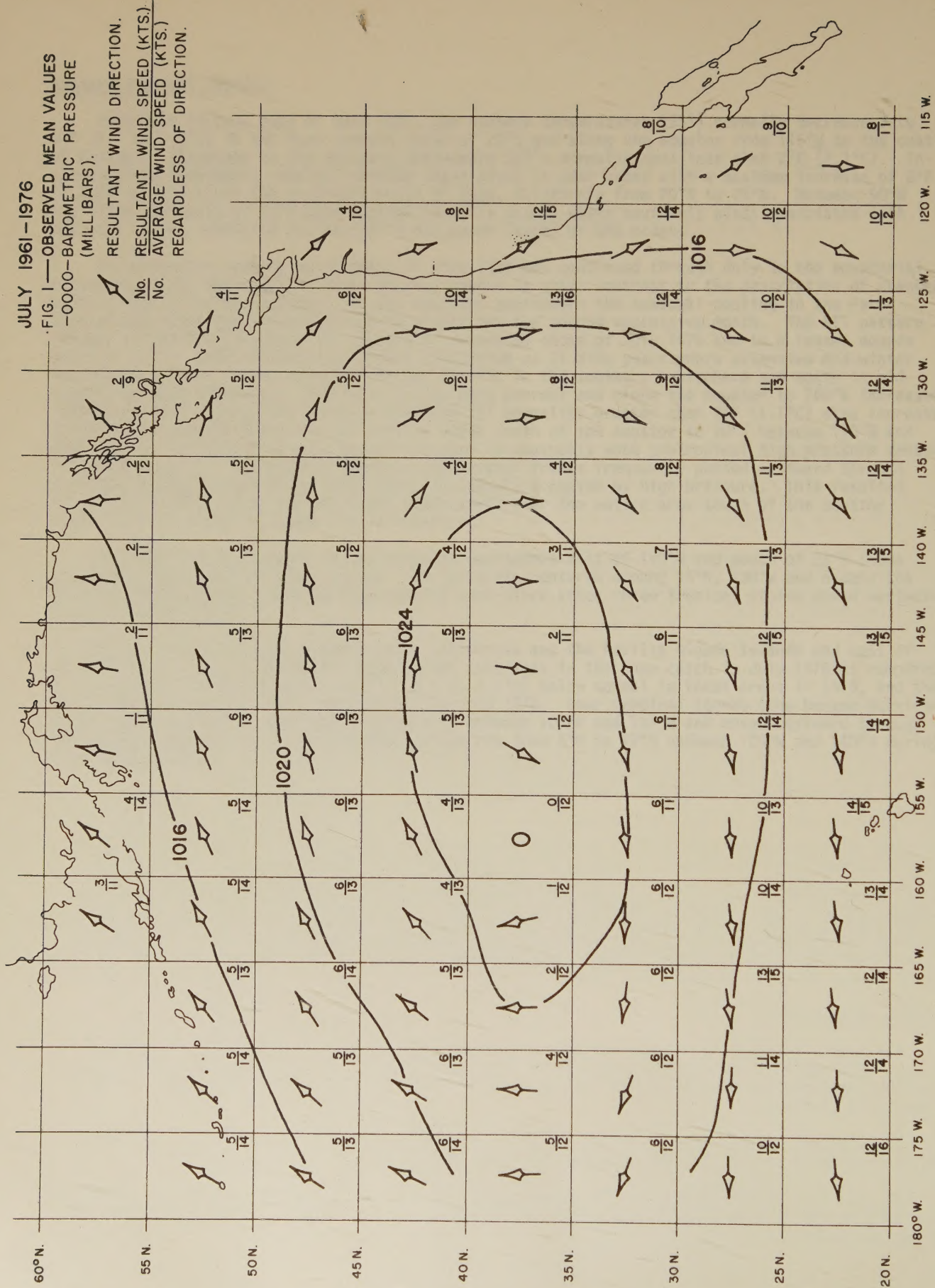
The tuna fishing grounds in the northern hemisphere east of 140°W and south of 23°N shows a warming trend slightly above normal. In two areas centered around 15°N, 130°W and around the Revilla Gigedo Islands, considerable warming took place after three tropical storms moved westward south of these areas.

In the fishing grounds between Baja, California and the Revilla Gigedo Islands and west of 120°W from 12°N to 5°N there were significant increases in the tuna catch in July 1976 as compared to July 1975. The SST's were 1 to 2°F (0.6 to 1.1°C) below normal in these areas in 1975, and they were 1 to 2°F (0.6 to 1.1°C) above normal in July 1976. Four tropical storms (one became hurricane Diana) developed in the warm water (Figure 9) between 100°W and 120°W and moved westward through the northern part of the fishing grounds which are from 5°N to 12°N between 120°W and 140°W during the summer months.

JULY 1961-1976

FIG. 1 — OBSERVED MEAN VALUES
— 0000 — BAROMETRIC PRESSURE
(MILLIBARS).

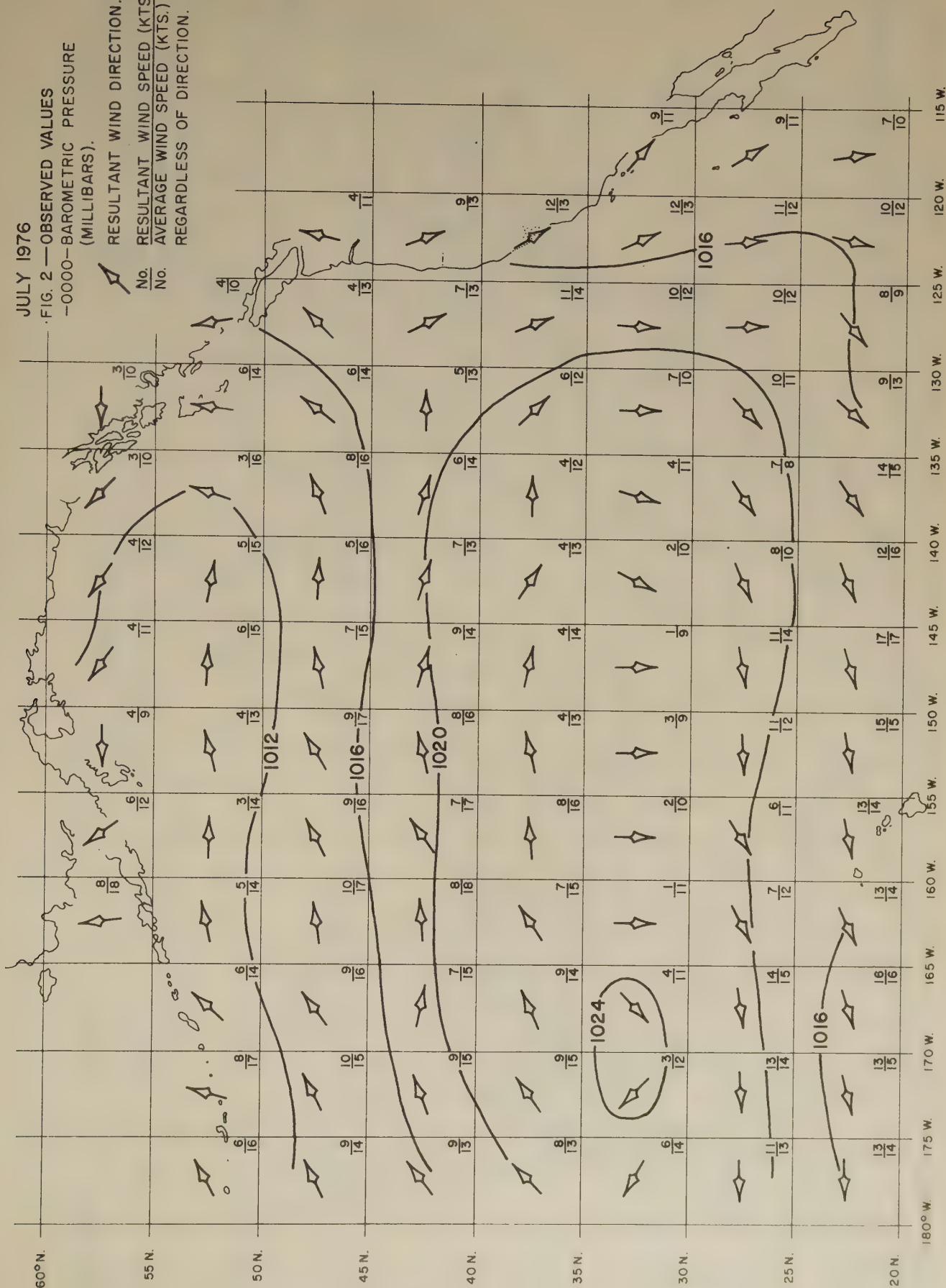
RESULTANT WIND DIRECTION.
No. —
No. —
RESULTANT WIND SPEED (KTS.)
AVERAGE WIND SPEED (KTS.)
REGARDLESS OF DIRECTION.



JULY 1976

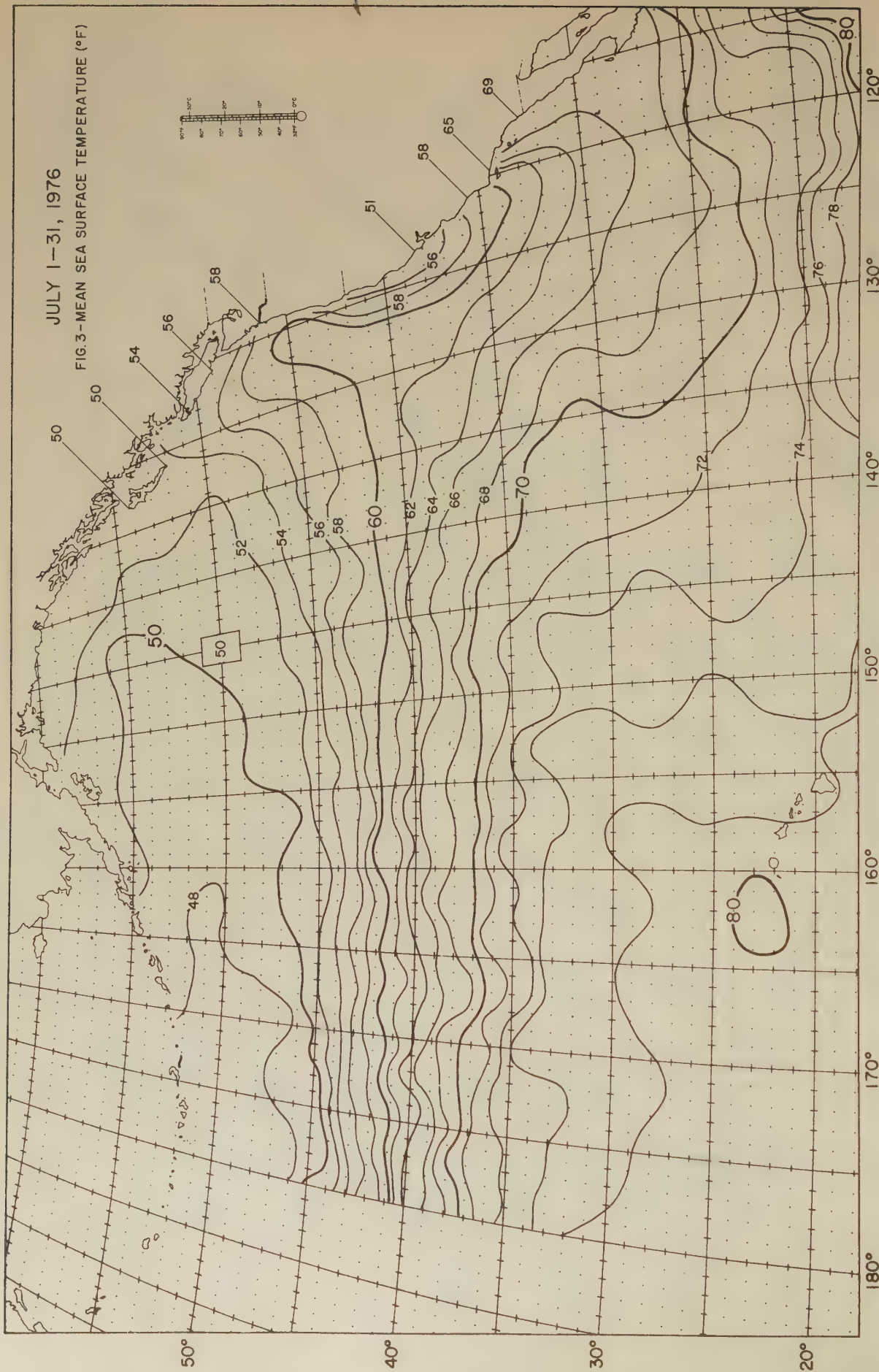
FIG. 2 — OBSERVED VALUES
— 0000 — BAROMETRIC PRESSURE
(MILLIBARS).

RESULTANT WIND DIRECTION.
No. No.
RESULTANT WIND SPEED (KTS.)
AVERAGE WIND SPEED (KTS.)
REGARDLESS OF DIRECTION.



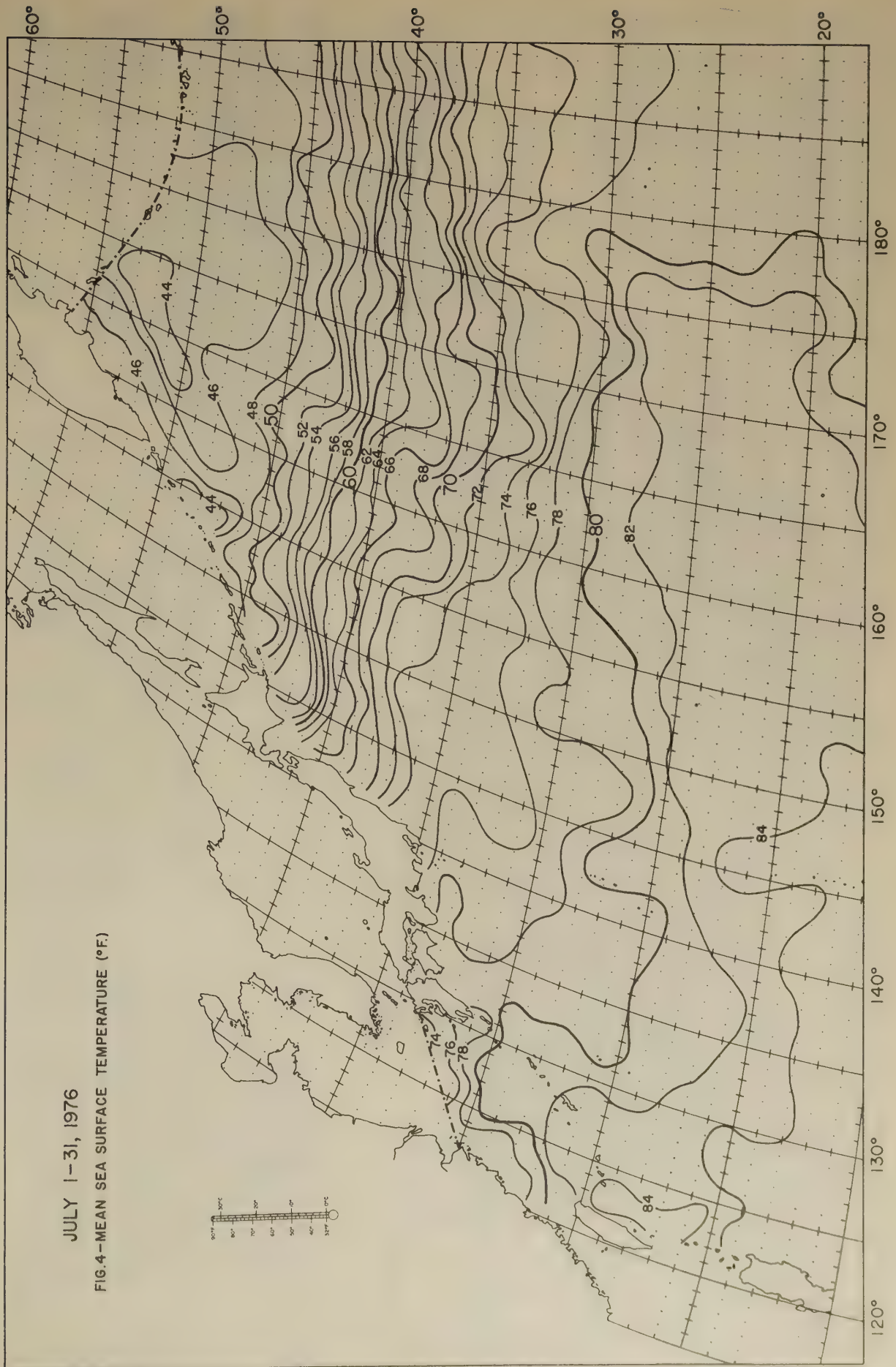
JULY 1-31, 1976

FIG. 3-MEAN SEA SURFACE TEMPERATURE (°F)



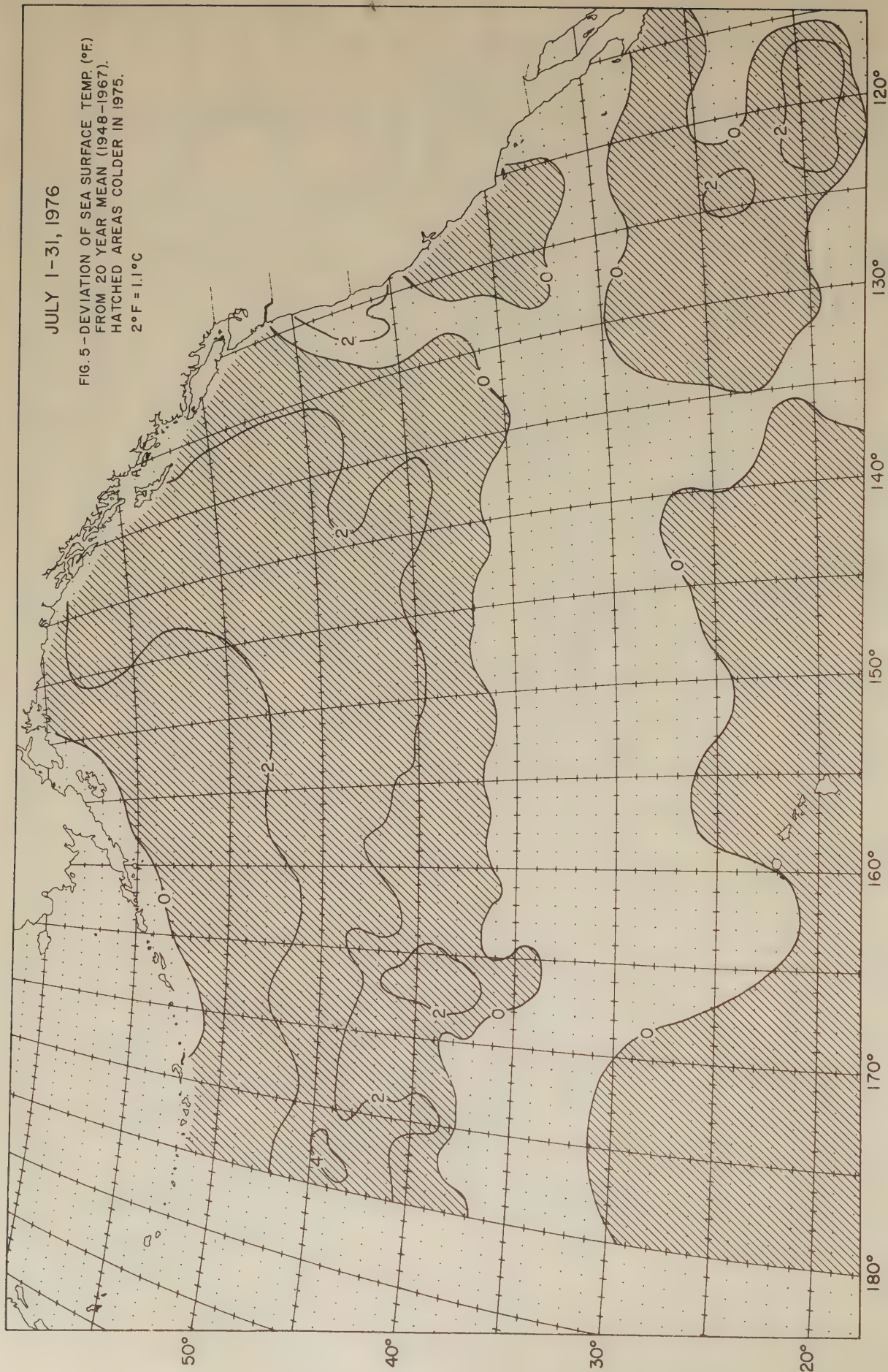
JULY 1-31, 1976

FIG. 4-MEAN SEA SURFACE TEMPERATURE (°F.)



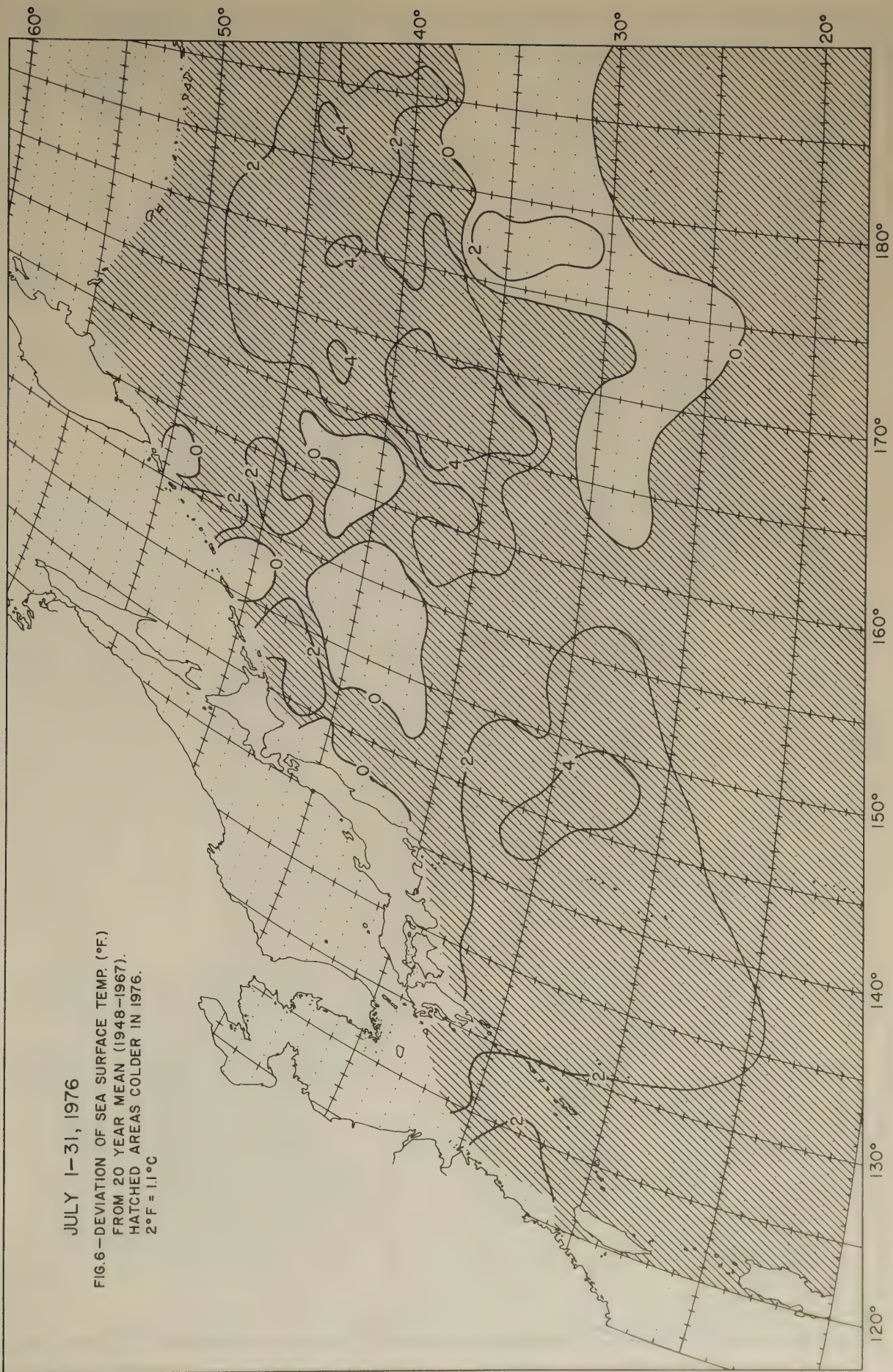
JULY 1-31, 1976

FIG. 5-DEVIATION OF SEA SURFACE TEMP (°F)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1975.
2°F = 1.1°C



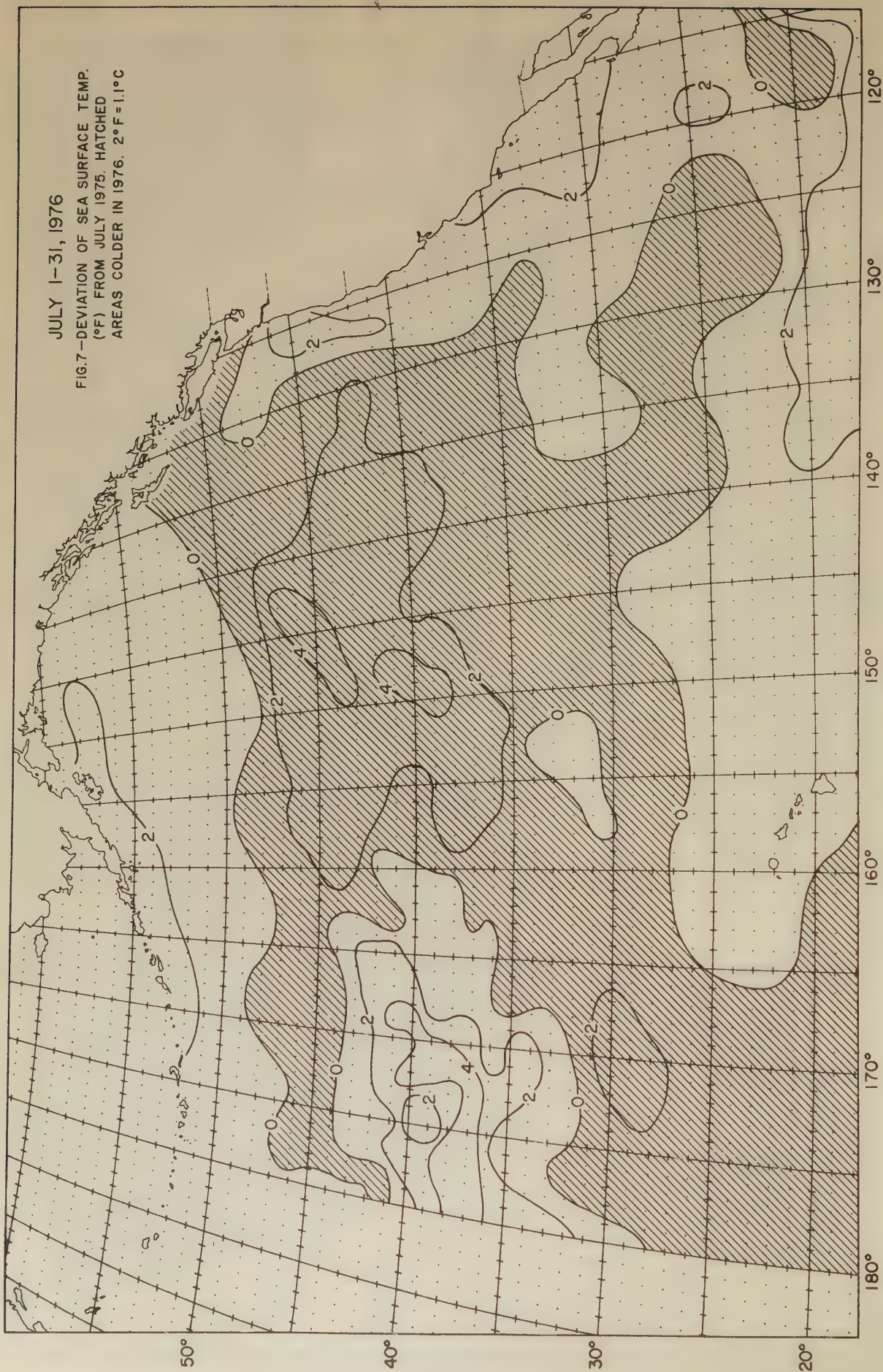
JULY 1-31, 1976

FIG. 6—DEVIATION OF SEA SURFACE TEMP. (°F.)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1976.
2°F = 1.1°C

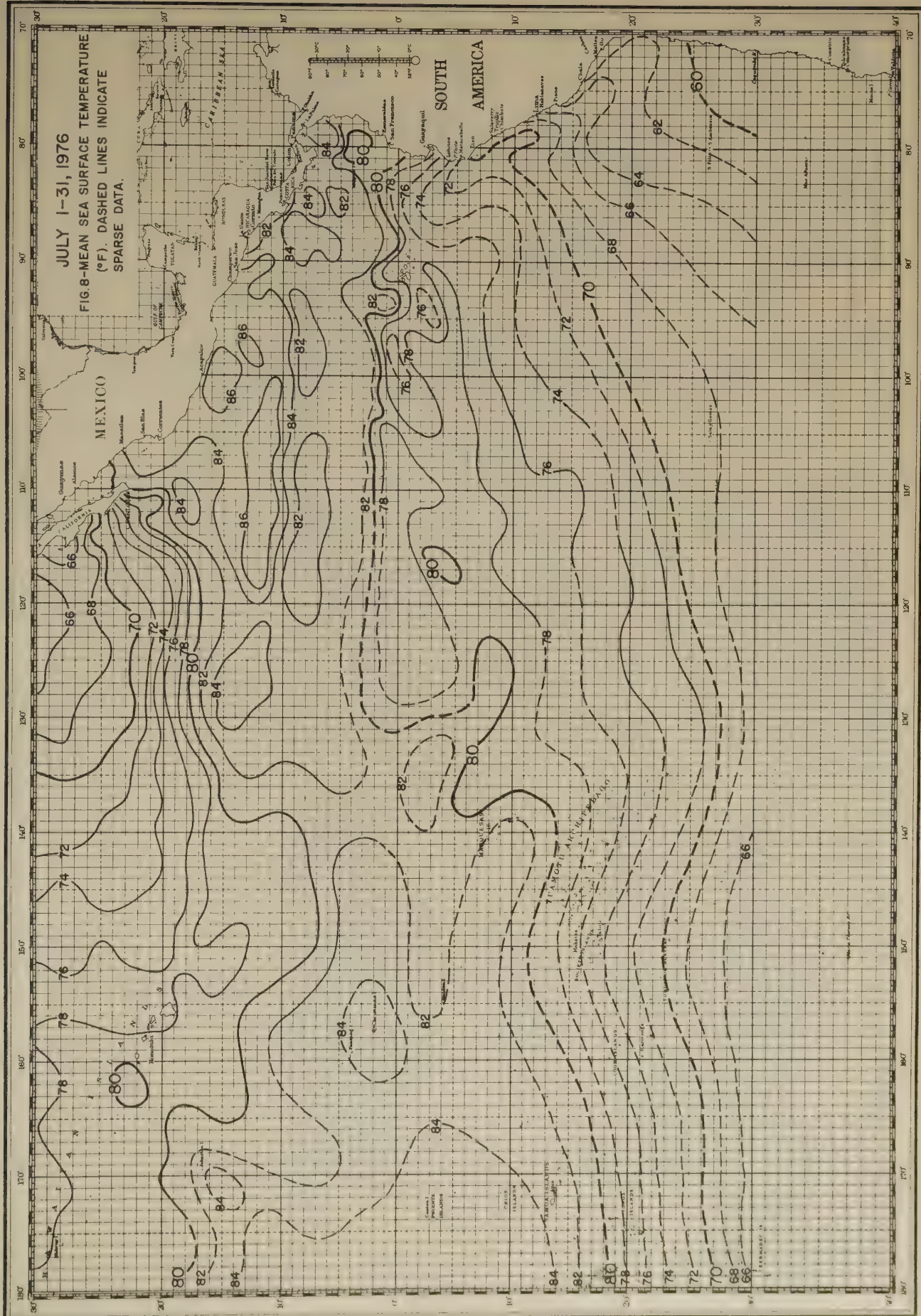


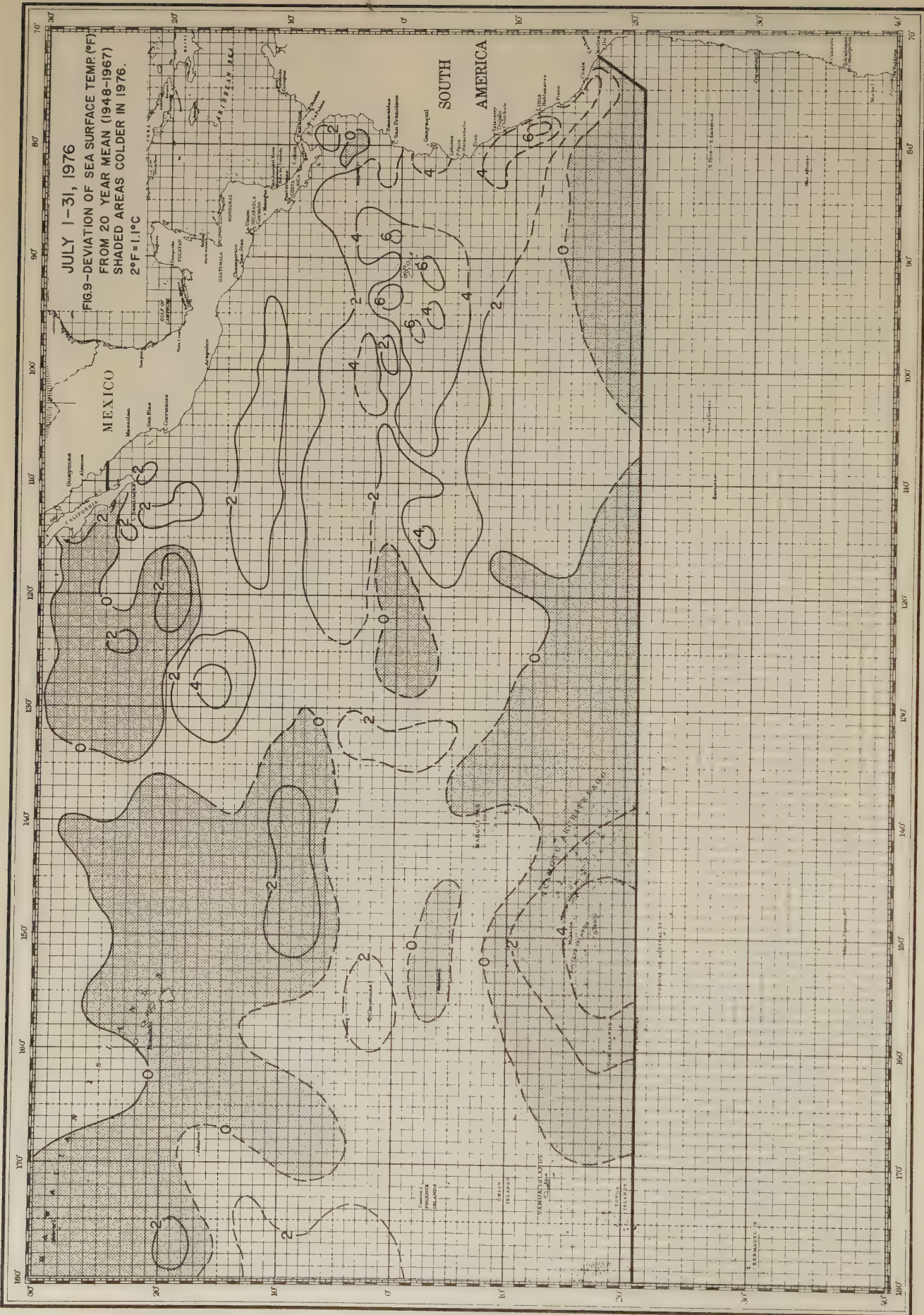
JULY 1-31, 1976

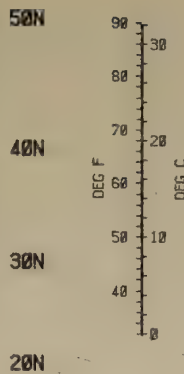
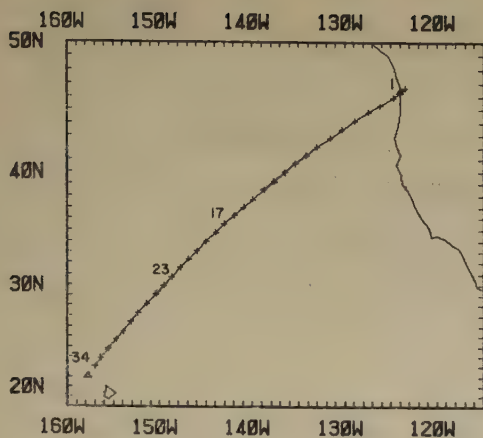
FIG. 7-DEVIATION OF SEA SURFACE TEMP.
(°F) FROM JULY 1975. HATCHED
AREAS COLDER IN 1976. $2^{\circ}\text{F} = 1.1^{\circ}\text{C}$



JULY 1-31, 1976
FIG. 8-MEAN SEA SURFACE TEMPERATURE
(°F). DASHED LINES INDICATE
SPARSE DATA.







SHIP CALIFORNIAN
VOYAGE 273
MATSON
PORTLAND, ORE.

- MAKAPUU PT, OAHU, HAWAII

17 JUL 1976 - 23 JUL 1976

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FIGURE 10

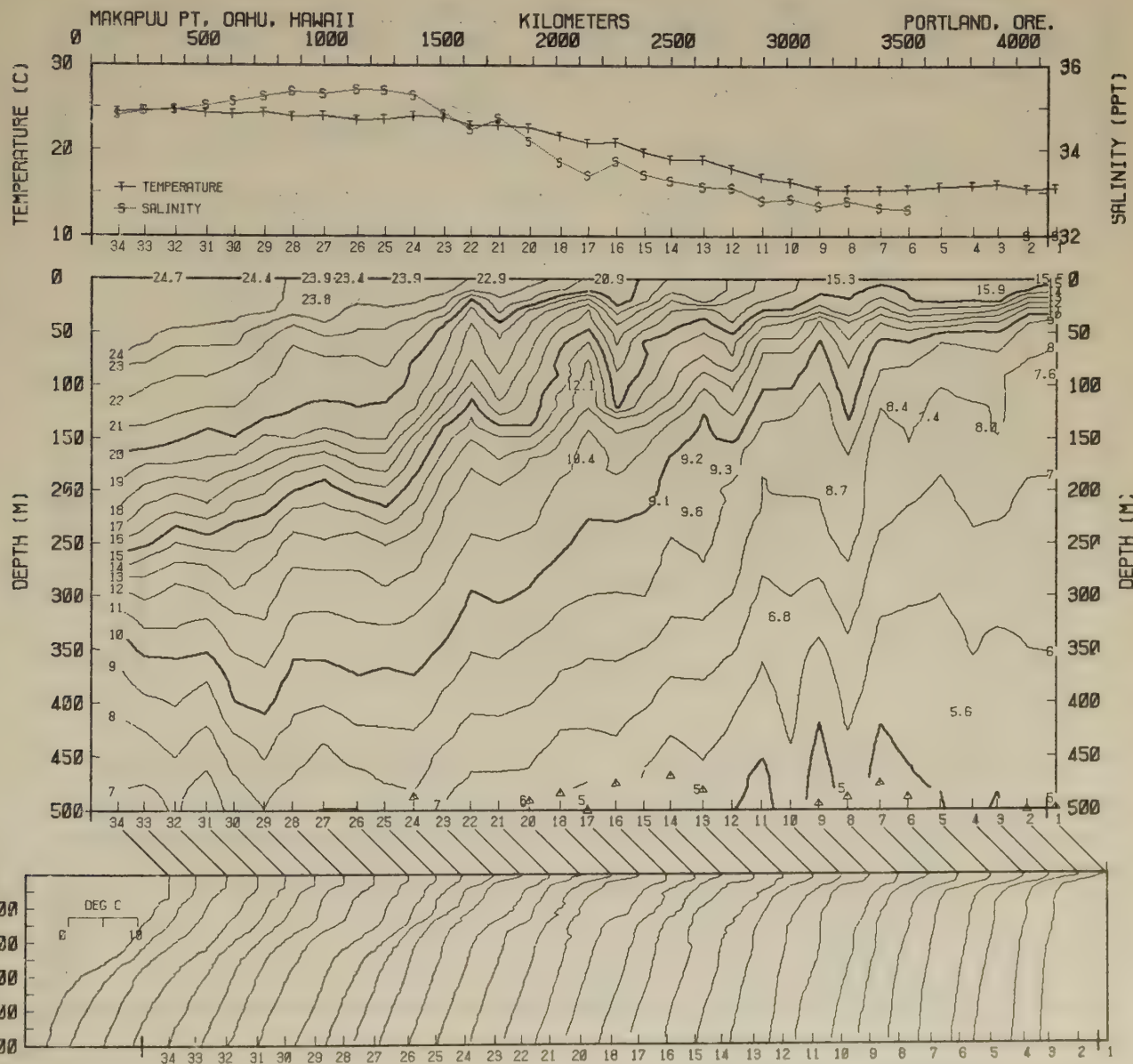
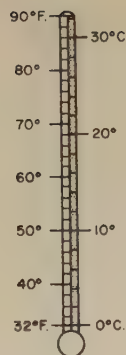
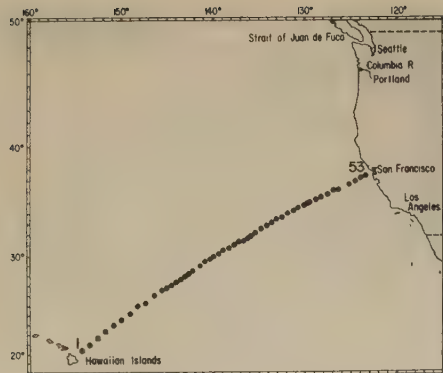


FIGURE 11



HILO - SAN FRANCISCO
JULY 2 - 7, 1976
CALIFORNIAN
VOYAGE 272

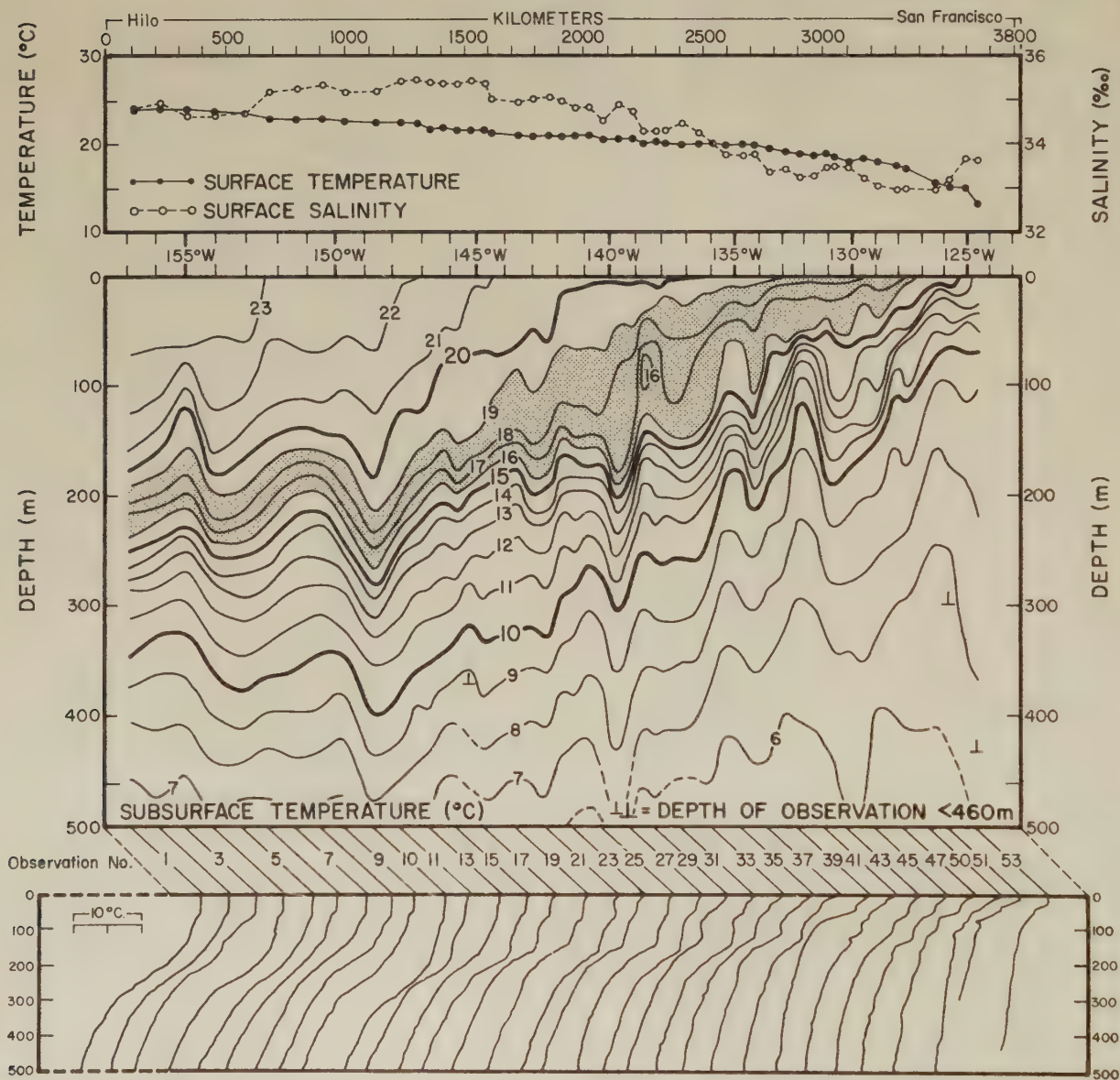
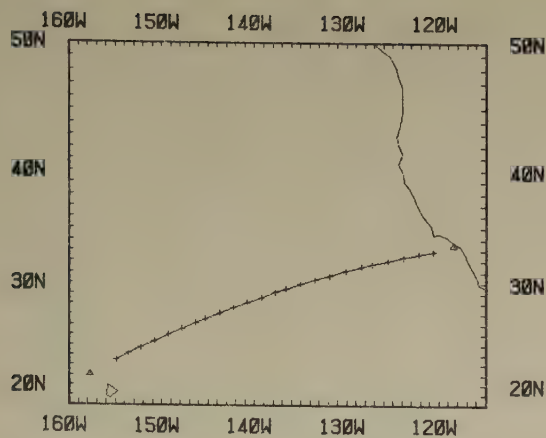


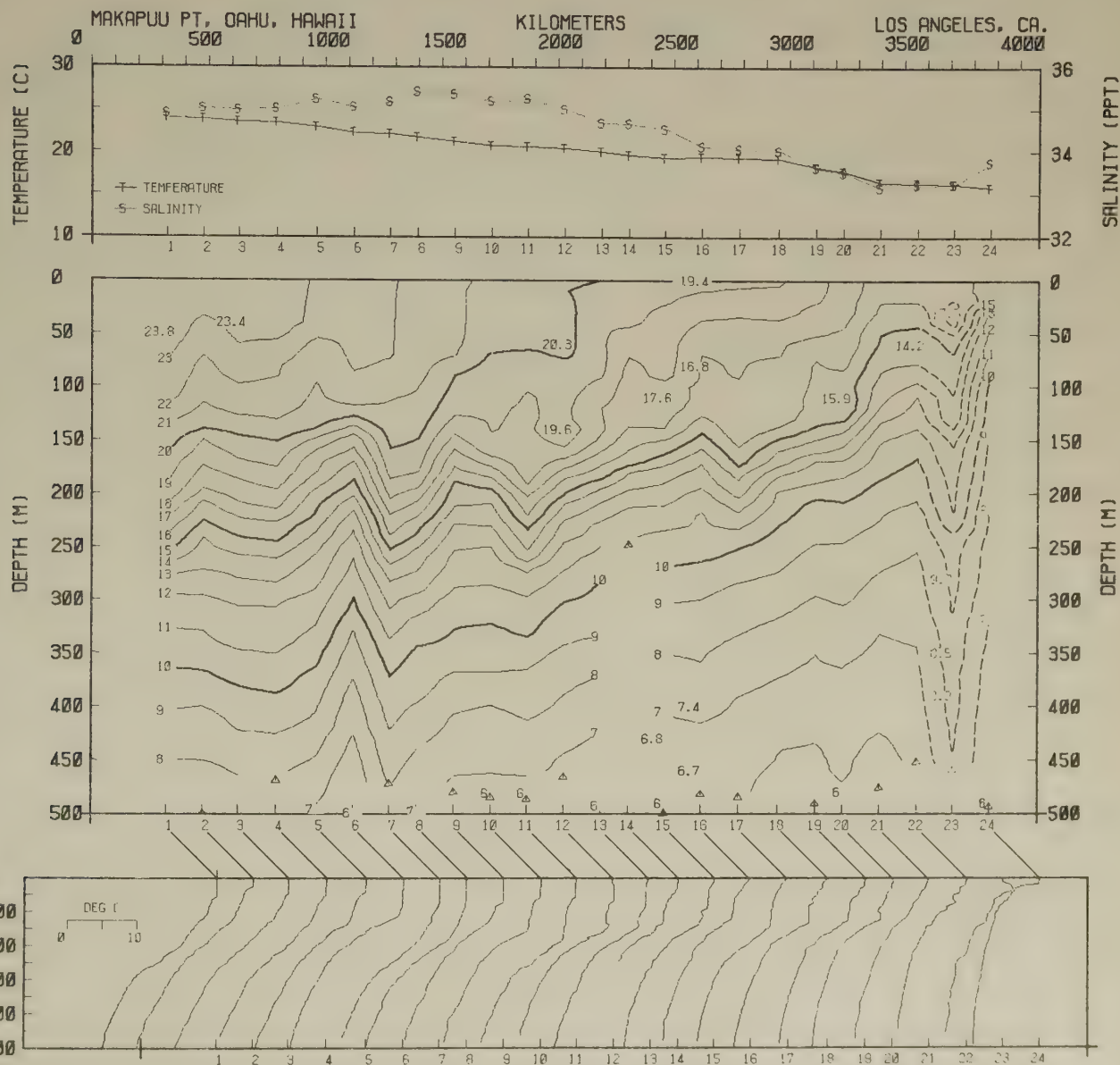
FIGURE 12



90
80
70
60
50
40
30
20
10
0

DEG F
DEG C

SHIP HAWAIIAN ENTERPRISE
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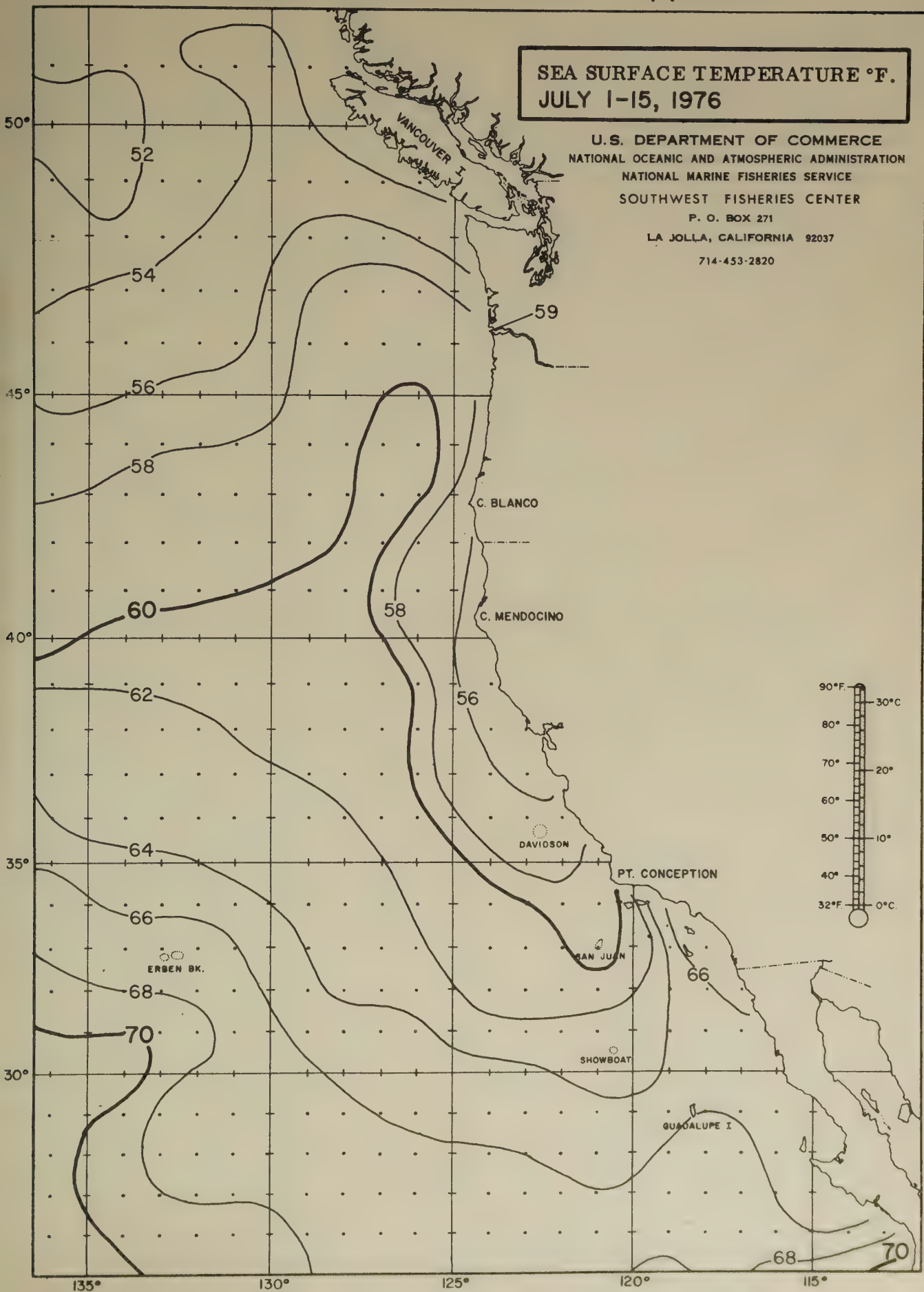
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FISHING INFORMATION - supplement

SEA SURFACE TEMPERATURE °F.
JULY 16-31, 1976

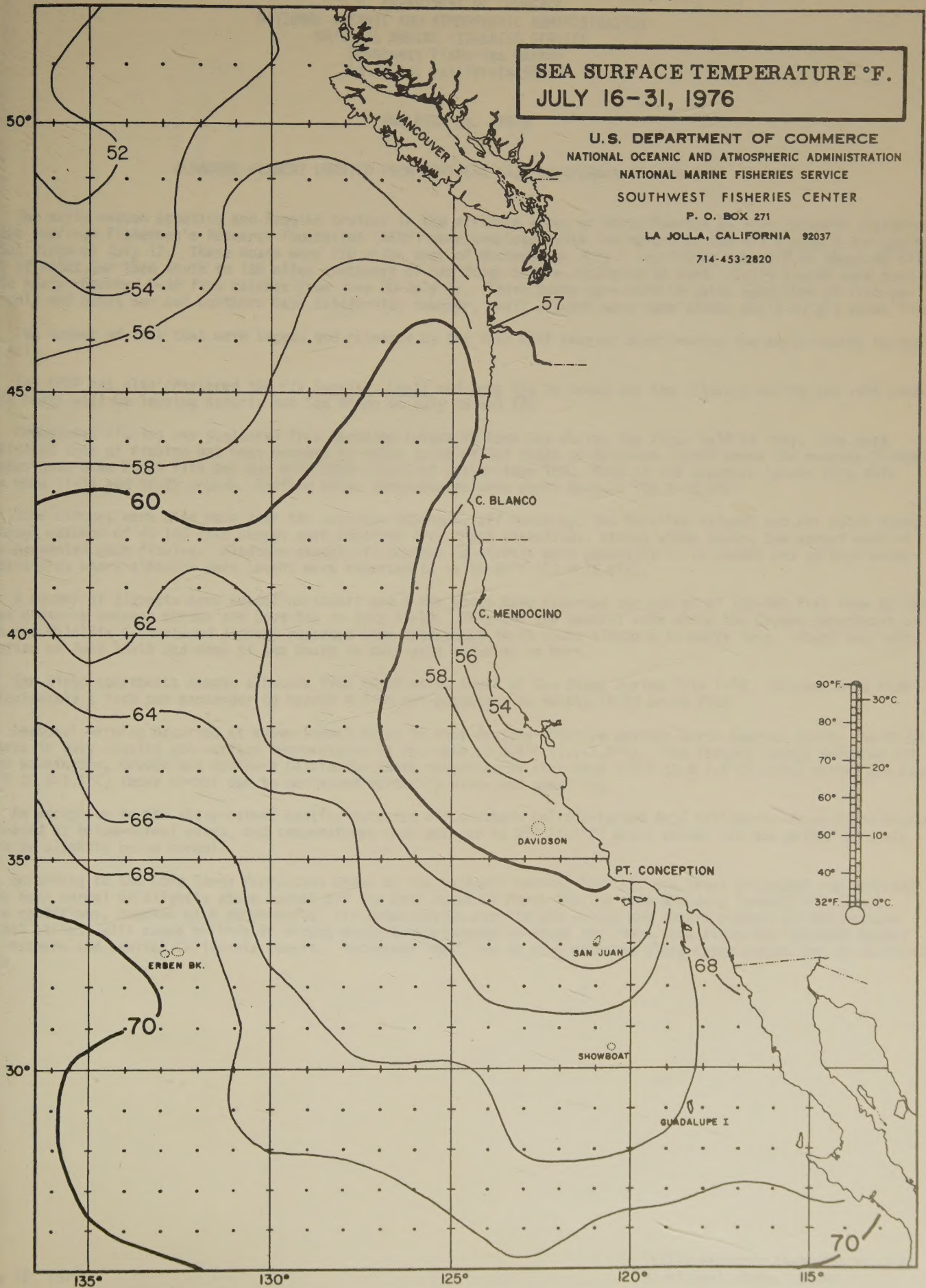
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La Jolla, California 92038

BULLETIN No. 76-3

ALBACORE FISHERY LOCATED FROM NORTHERN BAJA CALIFORNIA TO COOS BAY

The early season scouting and tagging cruises in the offshore areas of North America by four jigboats chartered by the American Fishermen's Research Foundation (AFRF) were completed with the return of the F/V Vivian M and Sea Finn to San Diego on July 12. These boats were 720 miles west of Monterey on July 1 and fished eastward to about 65 miles west of Point Sur then south to 135 miles southwest of San Diego before returning to port. Daily scores were poor as these boats reported 0-38 fish catches from June 30-July 11. These boats were able to catch more than 20 fish per day only off Point Sur and northern Baja California; however, small catches were made almost daily in all areas fished.

The number of fish that were tagged and released by the four AFRF charter boats during the early-season survey was 421.

The AFRF has also chartered the F/V Sunrise, Lusty and Deep Six to scout and tag albacore during the 1976 season. These boats will be leaving Astoria and San Diego on July 15 and 16.

Commercial fishing was scattered from Geronimo Island to Coos Bay during the first half of July. The most consistent area of fishing has been between 60 miles south of San Diego to Geronimo Island where the average jigboat catches have been 20-70 fish per day with high scores of better than 100. Much of the albacore landed from this area were 11-14 and 16-22 pounds. Surface water temperatures were about 65-66°F (18.3-18.9°C).

Some catches were also made near the Davidson Seamount, off Monterey, the Farallon Islands and off Point Arena. Although catches of 40-160 fish scores were reported from these vicinities, strong winds during the second week of July prevented much fishing. Albacore caught off central California were generally 11-15 pounds and surface water temperatures where albacore were caught were reported to be 56-60°F (13.3-15.6°C).

A number of jigboats have headed northward and a few boats have reported top scores of 100-200 fish from 80-120 miles offshore between Eureka and Coos Bay on July 11-13. This was the general area where the Oregon Department of Fish and Wildlife's chartered jigboat reported some catches of 16-18 pound albacore in early July. Rough seas were reported on July 14-15 and many of the boats in this area returned to port.

San Diego sportboats caught albacore from 40-90 miles south of San Diego during July 1-14. Catches were from approximately 1 fish per passenger to nearly 4 fish per passenger on mostly 18-23 pound fish.

Seasonal warming occurred at above-normal rates in most regions offshore western North America during the first weeks in July causing sea-surface temperatures to increase by 2-4°F (1.1-2.2°C). The largest change occurred off Oregon, Washington, Oregon and northern California where temperatures that were 1-2°F (0.6-1.1°C) below normal are now 2°F (0.6-1.1°C) above normal due to decreased northerly winds and upwelling.

An exception to the above-normal heating occurred off southern California and Baja California where temperatures increased at below-normal rates, and temperatures that were up to 2°F (1.1°C) above normal are now either slightly above or slightly below normal.

According to the Long Range Prediction Group of the National Weather Service, sea level pressures are expected to be near normal or slightly above normal off the west coast of North America from mid-July through mid-August. These conditions, coupled with above-normal air temperatures over inland valley and desert regions of the western coastal states, will cause periods of strong north-to-northwesterly winds and rough seas along the southern Oregon and northern and central California coasts. Increased upwelling is also expected along these coasts due to increased winds.

Staff, Albacore Fisheries Program
R. Michael Laurs, Leader

